VIRGINIA STANDARDS OF LEARNING

Spring 2005 Released Test

END OF COURSE GEOMETRY

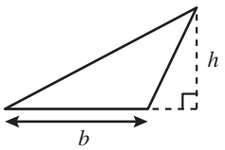
CORE 1

Property of the Virginia Department of Education

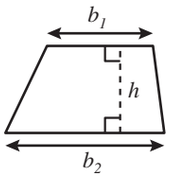
Printed in the United States of America

Geometry Formula Sheet

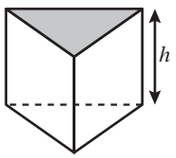
Geometric Formulas



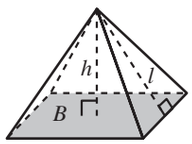
$A = \frac{1}{2}bh$



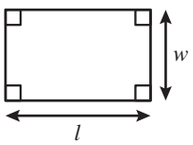
$A = \frac{1}{2}h(b_1 + b_2)$



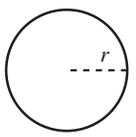
$V = Bh$
$L.A. = hp$
$S.A. = L.A. + 2B$



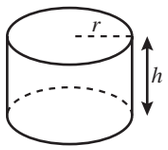
$V = \frac{1}{3}Bh$
$L.A. = \frac{1}{2}lp$
$S.A. = L.A. + B$



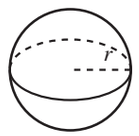
$A = lw$
$p = 2(l + w)$



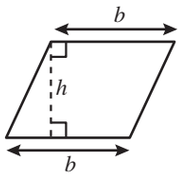
$A = \pi r^2$
$C = 2\pi r$



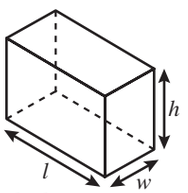
$V = \pi r^2 h$
$L.A. = 2\pi rh$
$S.A. = 2\pi r(h + r)$



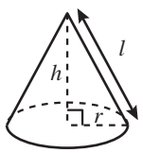
$V = \frac{4}{3}\pi r^3$
$S.A. = 4\pi r^2$



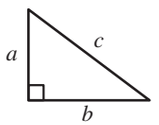
$A = bh$



$V = lwh$
$S.A. = 2lw + 2lh + 2wh$



$V = \frac{1}{3}\pi r^2 h$
$L.A. = \pi rl$
$S.A. = \pi r(l + r)$



$c^2 = a^2 + b^2$

Geometric Symbols

Example	Meaning
$\angle A$	angle A
$m\angle A$	measure of angle A
$\overline{AB}$	line segment AB
AB	measure of line segment AB
$\overleftrightarrow{AB}$	line AB
$\triangle ABC$	triangle ABC
$\square ABCD$	rectangle $ABCD$
$\square ABCD$	parallelogram $ABCD$

Example	Meaning
$\overrightarrow{AB}$	vector AB
	right angle
$\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$	Line AB is parallel to line CD.
$\overleftrightarrow{AB} \perp \overleftrightarrow{CD}$	Line AB is perpendicular to line CD.
$\angle A \cong \angle B$	Angle A is congruent to angle B.
$\triangle A \sim \triangle B$	Triangle A is similar to triangle B.
	Similarly marked segments are congruent.
	Similarly marked angles are congruent.

Abbreviations

Volume	V
Lateral Area	$L.A.$
Total Surface Area	$S.A.$
Area of Base	B

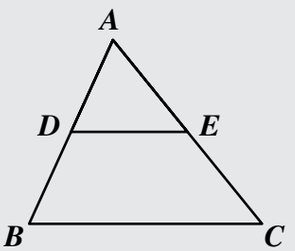
Pi

$\pi \approx 3.14$

$\pi \approx \frac{22}{7}$

DIRECTIONS
Read and solve each question. Then mark the space on the answer sheet for the best answer.

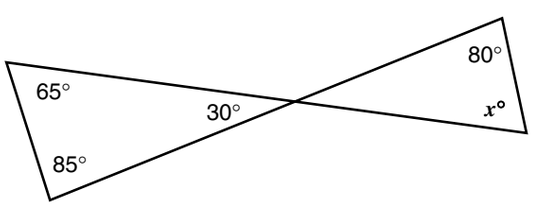
SAMPLE



If ΔABC is similar to ΔADE, then $AB : AD = ? : AE$. Which replaces the "?" to make the statement true?

A AC
B AE
C DE
D BC

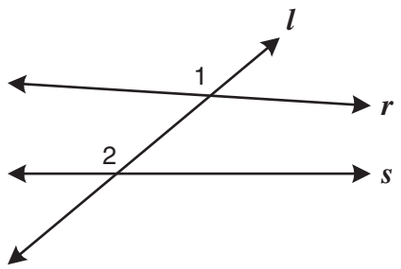
1 The measures of some angles are given in the figure.



What is the value of x?

A 65
B 70
C 80
D 85

2 The figure shows line l intersecting lines r and s.

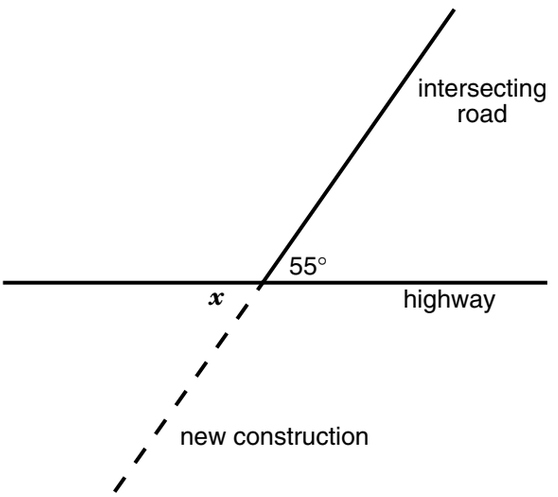


In the figure, $\angle 1$ and $\angle 2$ are —

F alternate interior angles
G alternate exterior angles
H corresponding angles
J consecutive interior angles

GO ON

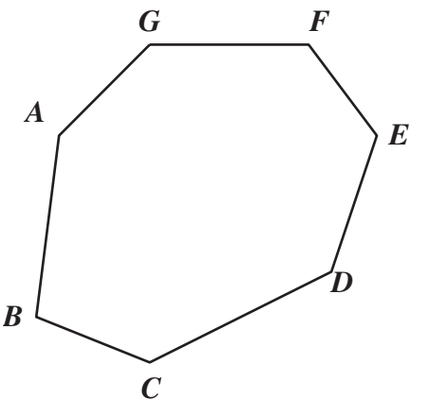
3 The Department of Transportation wants to extend the intersecting road across the highway, as indicated by the dotted line.



What should x be to ensure that the intersecting road and the new construction form a straight line?

A 35°
B 55°
C 105°
D 125°

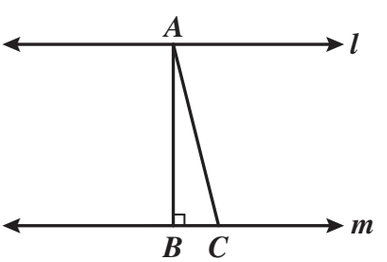
4 The polygon shown is convex.



The sum of its interior angle measures is —

F 900°
G 1,260°
H 1,620°
J 2,520°

5

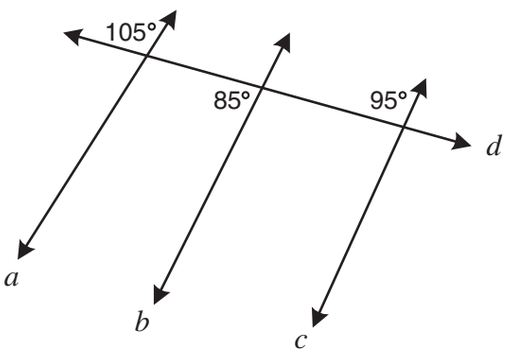


Which statement would be sufficient to prove that line l is parallel to line m?

A $\overline{AC} \perp m$
B $\overline{AB} \perp l$
C $\overline{AC} \perp l$
D $\overline{AB} \perp \overline{AC}$

GO ON

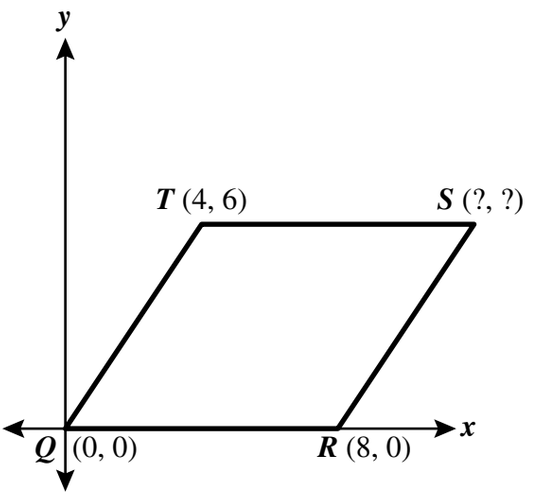
6 In this diagram, line *d* cuts three lines to form the angles shown.



Which two lines are parallel?

F *a* and *b*
G *a* and *c*
H *b* and *c*
J No lines are parallel.

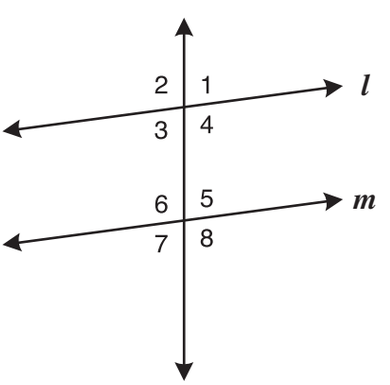
7 Quadrilateral *QRST* is placed on a coordinate grid as shown.



What coordinates for *S* make *QRST* a parallelogram?

A (8, 6)
B (8, 10)
C (12, 6)
D (12, 10)

8

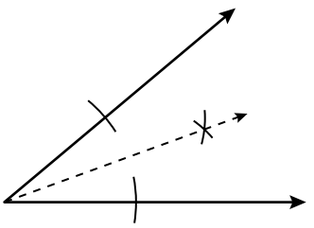


Which condition will guarantee that line *l* is parallel to line *m*?

F $\angle 1 \cong \angle 3$
G $\angle 1 \cong \angle 6$
H $\angle 6 \cong \angle 5$
J $\angle 3 \cong \angle 5$

GO ON

9



The drawing shows a compass and straightedge construction of —

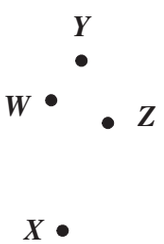
A a perpendicular to a given line from a point not on the line

B a perpendicular to a given line at a point on the line

C the bisector of a given angle

D an angle congruent to a given angle

10



Which point would be on a line perpendicular to *l* through *T*?

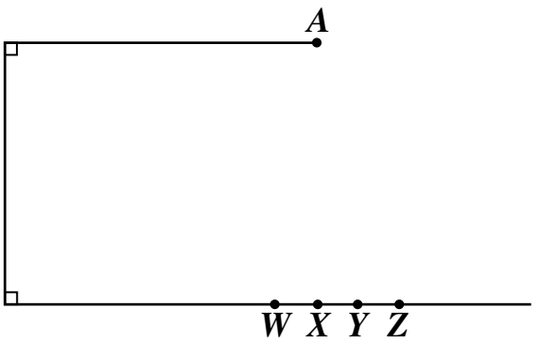
F *W*

G *X*

H *Y*

J *Z*

11



To which point should a line segment from *A* be drawn so that the resulting figure is a rectangle?

A *W*

B *X*

C *Y*

D *Z*

12 **ΔXYZ is similar to ΔSTR. $XY = 6$ and $ST = 12$. If the perimeter of ΔSTR is 38, then what is the perimeter of ΔXYZ?**

F 19

G 38

H 52

J 76

GO ON

13 **Let *p* represent**

$$\sqrt{11} = z\ ,$$

and let *q* represent

z is a rational number.

Which is a representation of the statement below?

If* $\sqrt{11} = z$*, then z is not a rational number.

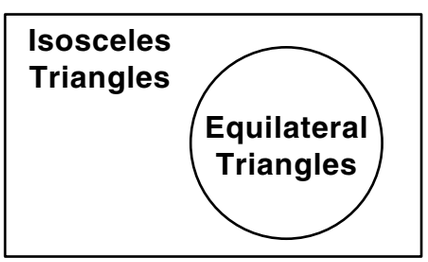
A $\sim p \rightarrow \sim q$

B $p \rightarrow q$

C $p \rightarrow \sim q$

D $\sim q \rightarrow \sim p$

14



According to the Venn diagram, which statement is true?

F All isosceles triangles are also equilateral triangles.

G All equilateral triangles are also isosceles triangles.

H Some equilateral triangles are also isosceles triangles.

J No isosceles triangles are equilateral triangles.

15 **Which of the following statements represents a valid argument?**

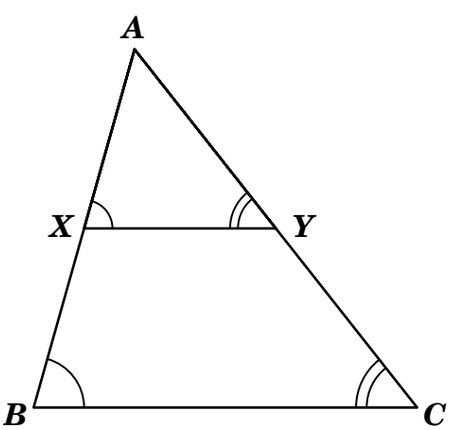
A If $a > b$ and $a > c$, then $b > c$.

B If $a > b$ and $b > c$, then $a > c$.

C If $a < b$ and $a < c$, then $c < b$.

D If $a > b$ and $a > c$, then $a > b + c$.

16 **Given:** $\angle AXY \cong \angle ABC$
$\angle AYX \cong \angle ACB$



Which is a true proportion?

F $\dfrac{AX}{AB} = \dfrac{AY}{AC} = \dfrac{XY}{BC}$

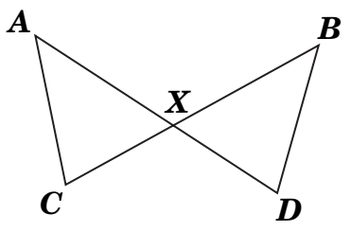
G $\dfrac{AX}{XB} = \dfrac{AY}{YC} = \dfrac{XY}{BC}$

H $\dfrac{XB}{AX} = \dfrac{YC}{AY} = \dfrac{BC}{XY}$

J $\dfrac{AX}{AB} = \dfrac{AC}{AY} = \dfrac{XY}{BC}$

GO ON

17 **Given: $\overline{AD}$ and $\overline{BC}$ intersect at X**
$AX = XB$
$CX = XD$



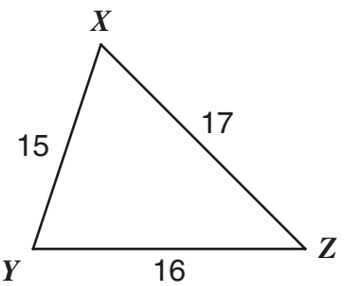
Which congruency statement is true?

A $\angle ACX \cong \angle BXD$
B $\angle ACX \cong \angle DXB$
C $\angle ACX \cong \angle BDX$
D $\angle ACX \cong \angle DBX$

18 **Which list could *not* be the measures of lengths of the three sides of a given triangle?**

F 5 cm, 12 cm, 15 cm
G 2 ft, 6 ft, 5 ft
H 11 mi, 4 mi, 12 mi
J 12 yd, 35 yd, 20 yd

19



In the drawing of triangle *XYZ*, which angle has the least measure?

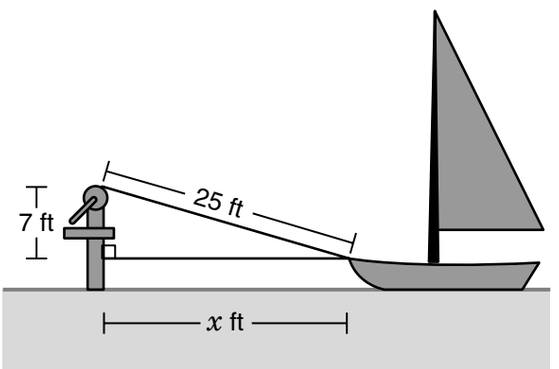
A All angles have the same measure.
B $\angle XYZ$
C $\angle ZXY$
D $\angle XZY$

20 **If $m\angle A = 65°$, $m\angle B = 15°$, $m\angle C = 100°$, which lists the sides of the triangle in order from shortest to longest?**

F $\overline{AC}$, $\overline{AB}$, $\overline{BC}$
G $\overline{BA}$, $\overline{BC}$, $\overline{AC}$
H $\overline{BA}$, $\overline{AC}$, $\overline{BC}$
J $\overline{AC}$, $\overline{BC}$, $\overline{BA}$

GO ON

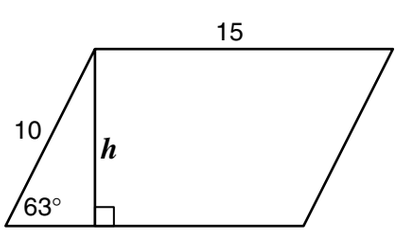
21 **A windlass is used to pull a boat to the dock. The rope is attached to the boat at a point 7 feet below the level of the windlass.**



What is the distance from the boat to the dock when the rope is 25 feet?

A 25 ft
B 24 ft
C 18 ft
D 7 ft

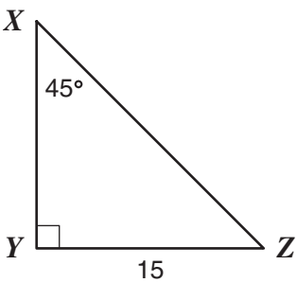
22 **The parallelogram has the measurements shown.**



Which is closest to the length of the altitude, *h*?

F 19.63
G 8.91
H 8.67
J 6.81

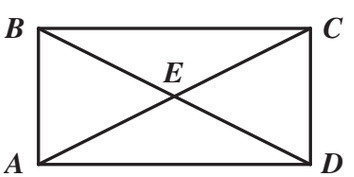
23



For the triangle represented by the above drawing, what is the length of $\overline{XZ}$?

A $7.5\sqrt{2}$
B $7.5\sqrt{3}$
C $15\sqrt{2}$
D $15\sqrt{3}$

24

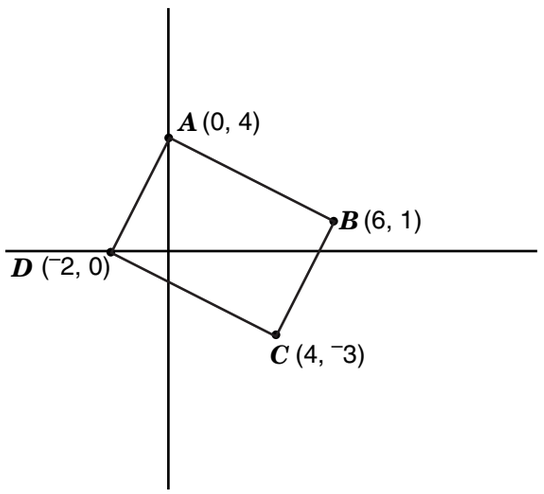


In rectangle *ABCD*, which of the following pairs of segments are *not* necessarily congruent?

F $\overline{BD}$ and $\overline{AC}$
G $\overline{AB}$ and $\overline{CD}$
H $\overline{BC}$ and $\overline{DC}$
J $\overline{BE}$ and $\overline{CE}$

GO ON

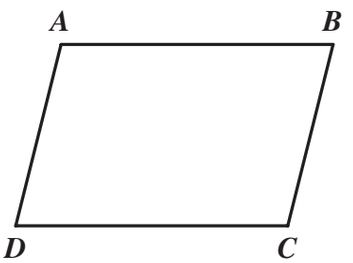
25 **The town plaza in a certain town is a parallelogram. The town's planning committee has decided to build a fountain at the center of the plaza. This sketch shows the corner points when placed on a coordinate grid.**



Which coordinates show where the fountain will be located?

A (2, 0.5)
B (0.5, 2)
C (3, 1.5)
D (1.5, 1)

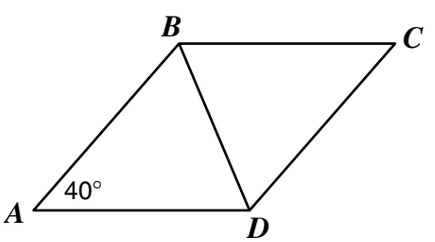
26 **Quadrilateral *ABCD* is a parallelogram.**



Which of the following *must* be true?

F $\overline{AB} \cong \overline{AD}$
G $\overline{AC} \cong \overline{BD}$
H $\angle A \cong \angle D$
J $\angle B \cong \angle D$

27 ***ABCD* is a rhombus.**



What is the measure of $\angle CBD$?

A 50°
B 60°
C 70°
D 75°

GO ON

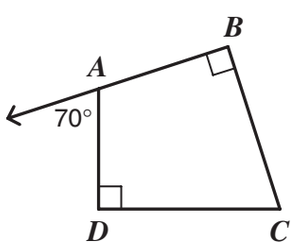
28 **If each interior angle of a regular polygon measures 120°, how many sides does the polygon have?**

F 14
G 12
H 8
J 6

29 **Which angle measure below is *not* a possible measure of an exterior angle of a regular polygon?**

A 36°
B 40°
C 45°
D 54°

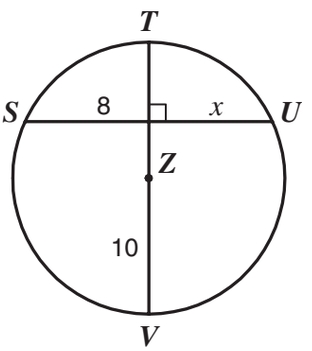
30



In the figure, what is the measure of $\angle C$?

F 70°
G 90°
H 100°
J 110°

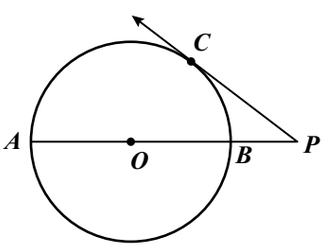
31 **$\overline{TV}$ is a diameter of circle Z.**



What is the value of x?

A 4
B 6
C 8
D 10

32

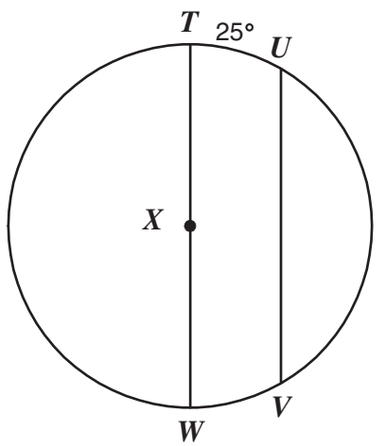


If $AP = 8$ and $PC = 4$, what is the measure of $\overline{AB}$, the *diameter* of this circle?

F 2
G 4
H 6
J 8

GO ON

33 $\overline{TW}$ **is a diameter of circle** X**, and** $\overline{TW}$ **is parallel to** $\overline{UV}$**.**



If the measure of $\overset{\frown}{TU}$ **is 25°, what is the degree measure of** $\overset{\frown}{UV}$**?**

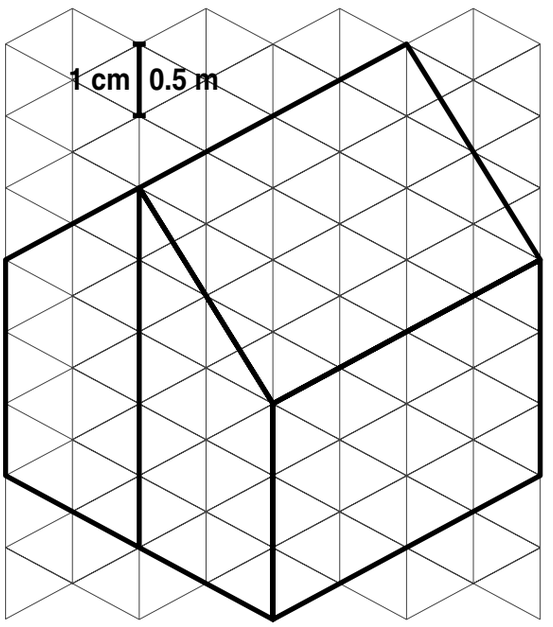
A 115°

B 130°

C 155°

D 210°

34 This is a scale drawing of a tent where 1 centimeter represents 0.5 meter.



What is the height of the tent at its highest point?

F 10 m

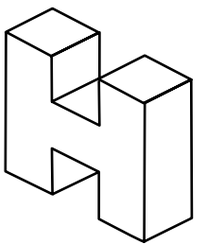
G 5 m

H 3 m

J 2.5 m

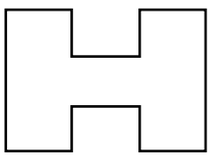
GO ON

35



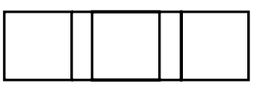
Which represents a two-dimensional view from directly above the figure?

A

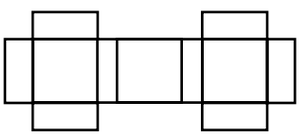


B

C



D



36 **To the nearest gallon, what is the volume of a cylindrical water heater 1.4 feet in diameter and 4 feet tall? (1 cubic foot = 7.48 gallons)**

F 34 gal

G 46 gal

H 59 gal

J 132 gal

37 **A spherical paintball measures 1.5 centimeters in diameter. Approximately how much paint is in it?**

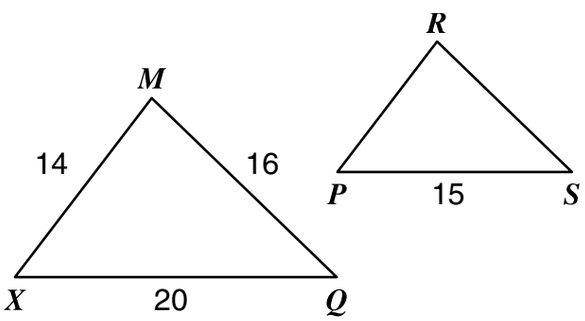
A 1.77 cm^3

B 7.07 cm^3

C 9.42 cm^3

D 14.13 cm^3

38



Which proportion can be used to find the value of $\overline{PR}$ if ΔXMQ is similar to ΔPRS?

F $\frac{20}{15} = \frac{14}{PR}$

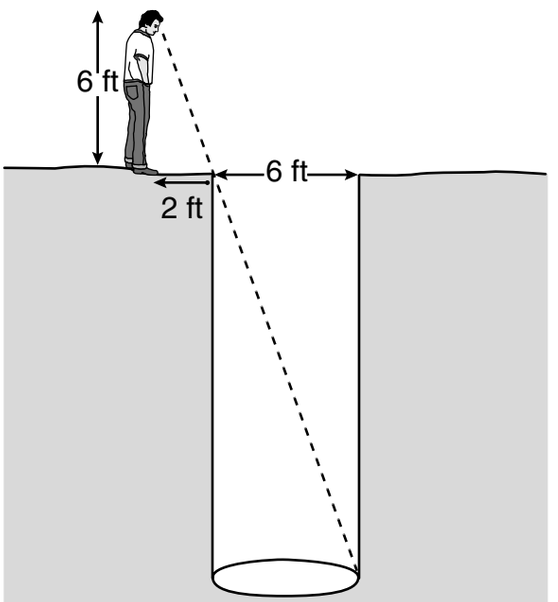
G $\frac{10}{5} = \frac{7}{PR}$

H $\frac{14}{20} = \frac{15}{PR}$

J $\frac{15}{20} = \frac{14}{PR}$

GO ON

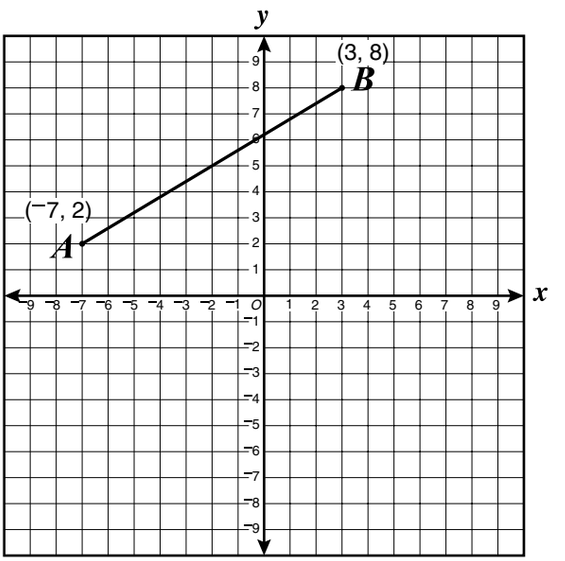
39 **When standing upright, Gary knows his eyes are 6 feet above ground level. To determine the depth of a well, he stands in the position shown.**



Using the given measures, how deep is the well?

A 12 ft
B 14 ft
C 16 ft
D 18 ft

40

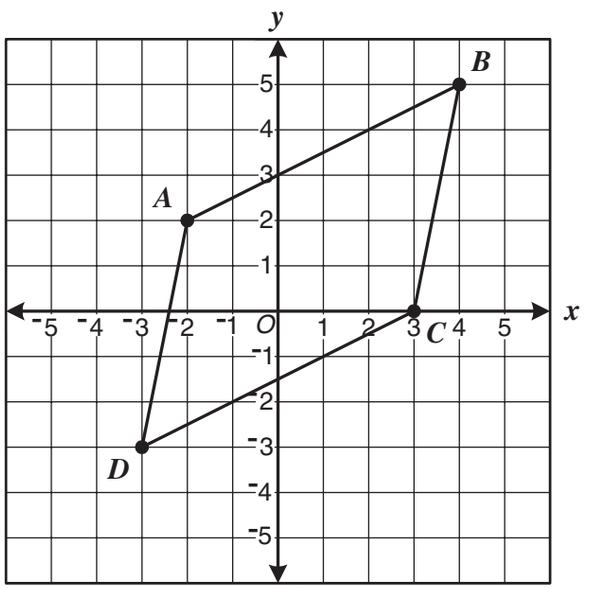


The coordinates of the midpoint of $\overline{AB}$ are —

F (5, 3)
G (−5, 3)
H (2, 5)
J (−2, 5)

GO ON

41 **Parallelogram *ABCD* is placed on a coordinate grid as shown.**



What is the approximate length of diagonal $\overline{AC}$?

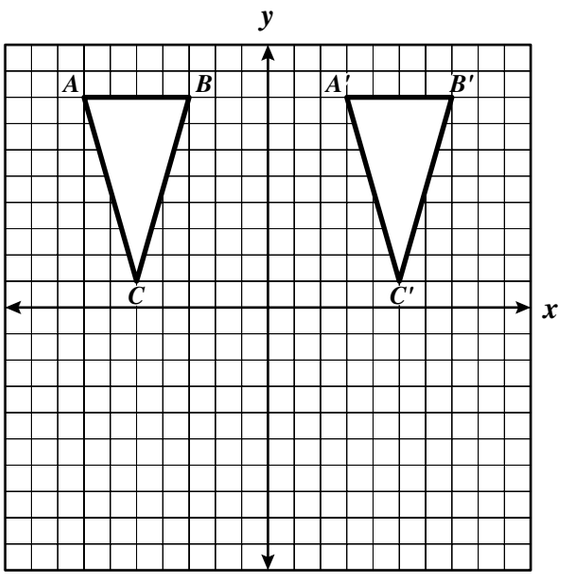
A 3.0 units

B 5.4 units

C 9.0 units

D 10.6 units

42



Triangle $A'B'C'$ is —

F a translation of triangle *ABC* across the *y*-axis

G a 90° clockwise rotation of triangle *ABC* about the origin

H a reflection of triangle *ABC* across the *y*-axis

J a reflection of triangle *ABC* across the *x*-axis

GO ON

43 **How many different lines of symmetry does a square have?**

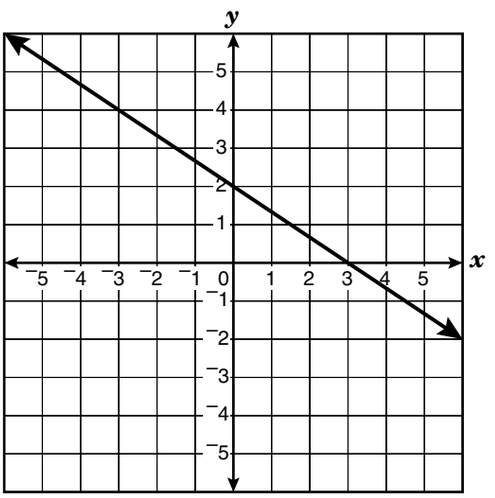
A 1

B 2

C 3

D 4

44



Which is most likely the slope of the line graphed?

F -4

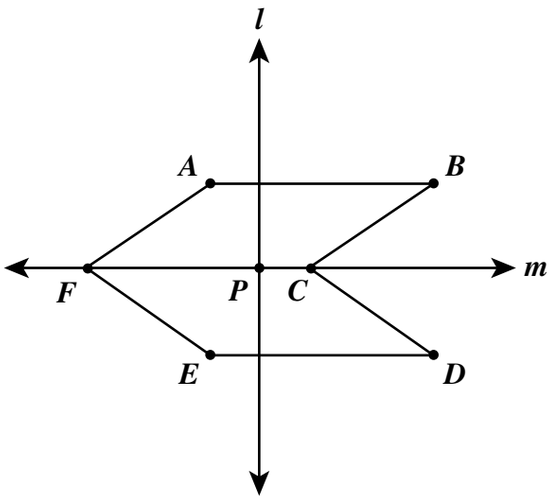
G $-\frac{3}{2}$

H $-\frac{2}{3}$

J 4

GO ON

45



Hexagon *ABCDEF* is apparently symmetric with respect to —

A point P only

B line m only

C line l only

D both lines l and m only

STOP

Answer Key

Test Sequence Number	Correct Answer	Reporting Category	Reporting Category Description
1	B	001	Lines and Angles
2	H	001	Lines and Angles
3	B	001	Lines and Angles
4	F	001	Lines and Angles
5	B	001	Lines and Angles
6	H	001	Lines and Angles
7	C	001	Lines and Angles
8	J	001	Lines and Angles
9	C	001	Lines and Angles
10	H	001	Lines and Angles
11	B	001	Lines and Angles
12	F	002	Triangles and Logic
13	C	002	Triangles and Logic
14	G	002	Triangles and Logic
15	B	002	Triangles and Logic
16	F	002	Triangles and Logic
17	C	002	Triangles and Logic
18	J	002	Triangles and Logic
19	D	002	Triangles and Logic
20	J	002	Triangles and Logic
21	B	002	Triangles and Logic
22	G	002	Triangles and Logic
23	C	002	Triangles and Logic
24	H	003	Polygons and Circles
25	A	003	Polygons and Circles
26	J	003	Polygons and Circles
27	C	003	Polygons and Circles
28	J	003	Polygons and Circles
29	D	003	Polygons and Circles
30	F	003	Polygons and Circles
31	C	003	Polygons and Circles
32	H	003	Polygons and Circles
33	B	003	Polygons and Circles
34	J	004	Three-Dimensional Figures
35	B	004	Three-Dimensional Figures
36	G	004	Three-Dimensional Figures
37	A	004	Three-Dimensional Figures
38	F	004	Three-Dimensional Figures
39	D	004	Three-Dimensional Figures
40	J	005	Coordinate Relations and Transformations
41	B	005	Coordinate Relations and Transformations
42	F	005	Coordinate Relations and Transformations
43	D	005	Coordinate Relations and Transformations
44	H	005	Coordinate Relations and Transformations
45	B	005	Coordinate Relations and Transformations